

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 2000OP-0042	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/KR00/00652</b>	International filing date (day/month/year) 22 JUNE 2000 (22.06.2000)	(Earliest) Priority Date (day/month/year) 29 MARCH 2000 (29.03.2000)
Applicant Kwon, So		

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (See Box II).

4. With regard to the title,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:  
Transmission System and Method for Multiple Pictures

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. The figure of the drawing to be published with the abstract is Figure No. 2

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☒ because this figure better characterizes the invention.

☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/KR00/00652

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7 G06F 15/16

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7 G06F 15/16

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
Korean patents and applications for inventions since 1975  
Korean utility models and applications for utility models since 1975Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
http://ep.espacenet.com(Worldwide search in the European Patent Office), "Charge and Coupled and Device and Beehive"  
IEEE/IEE Electronic library(since 1988), "Charge and Coupled and Device and Beehive"

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 93-17070 A (SAMSUNG ELECTRONICS CO., LTD) 29 July 1993 (29.07.93) the whole document	1, 3-7
Y	CHEOL-HEE GARNG ET AL: "APPLICATION CONTENTS TECHNOLOGY" UP-TO-DATE COMPUTER/TELECOMMUNICATIONS/BROADCASTING TECHNOLOGY ILLUSTRATED BY DRAWINGS, Kyobobook publishing Co., Ltd, Seoul Korea, 13 August 1999, pages 415-420	1, 3-7

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

## \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
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- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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- "&" document member of the same patent family

Date of the actual completion of the international search  
29 JULY 2000 (29.07.2000)Date of mailing of the international search report  
31 JULY 2000 (31.07.2000)Name and mailing address of the ISA/KR  
Korean Industrial Property Office  
Government Complex-Taejon, Dunsan-dong, So-ku, Taejon  
Metropolitan City 302-701, Republic of Korea  
Facsimile No. 82-42-472-7140Authorized officer  
KIM, Beom Yong

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# PCT

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference  
(if desired) (12 characters maximum) 2000 OP - 0042

**Box No. I TITLE OF INVENTION**  
AN ELECTRICAL TRANSMISSION SYSTEM FOR MULTIPLE PICTURES AND ITS TRANSMISSION METHOD THROUGH INTERNET

### Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

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Teleprinter No.

State (that is, country) of nationality: KR

State (that is, country) of residence: KR

This person is applicant for the purposes of: ☒ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

### Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
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### Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

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Facsimile No.  
82-2-566-6220

Teleprinter No.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Form PCT/RO/101 (first sheet) (July 1998; reprint January 2000)

See Notes to the request form

문서담당	대리(과장)	실장(부장)	이 사	소장(대표)	결재
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**Box No.V DESIGNATION OF STATES**

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

**Regional Patent**

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- Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:
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**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)


<b>Box No. VI PRIORITY CLAIM</b>		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: * regional Office	international application: receiving Office
item (1) 29, March 2000 29/03/2000	2000-0016103	KR		
item (2)				
item (3)				

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): \_\_\_\_\_

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(iii)). See Supplemental Box.

<b>Box No. VII INTERNATIONAL SEARCHING AUTHORITY</b>			
<b>Choice of International Searching Authority (ISA)</b> <small>(if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):</small>		<b>Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):</b>	
ISA /		Date (day/month/year)	Number Country (or regional Office)

<b>Box No. VIII CHECK LIST; LANGUAGE OF FILING</b>	
This international application contains the following number of sheets: request : 3 description (excluding sequence listing part) : 8 claims : 3 abstract : 1 drawings : 5 sequence listing part of description : _____ <b>Total number of sheets : 20</b>	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input type="checkbox"/> other (specify):
<b>Figure of the drawings which should accompany the abstract:</b> Fig.1	<b>Language of filing of the international application:</b> English

<b>Box No. IX SIGNATURE OF APPLICANT OR AGENT</b>	
<small>Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).</small>	
PARK, Won Yong 	

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1. Date of actual receipt of the purported international application: 3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application: 4. Date of timely receipt of the required corrections under PCT Article 11(2): 5. International Searching Authority (if two or more are competent): ISA /	2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received: 6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.

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4 October 2001 (04.10.2001)

PCT

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(81) Designated States (*national*): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

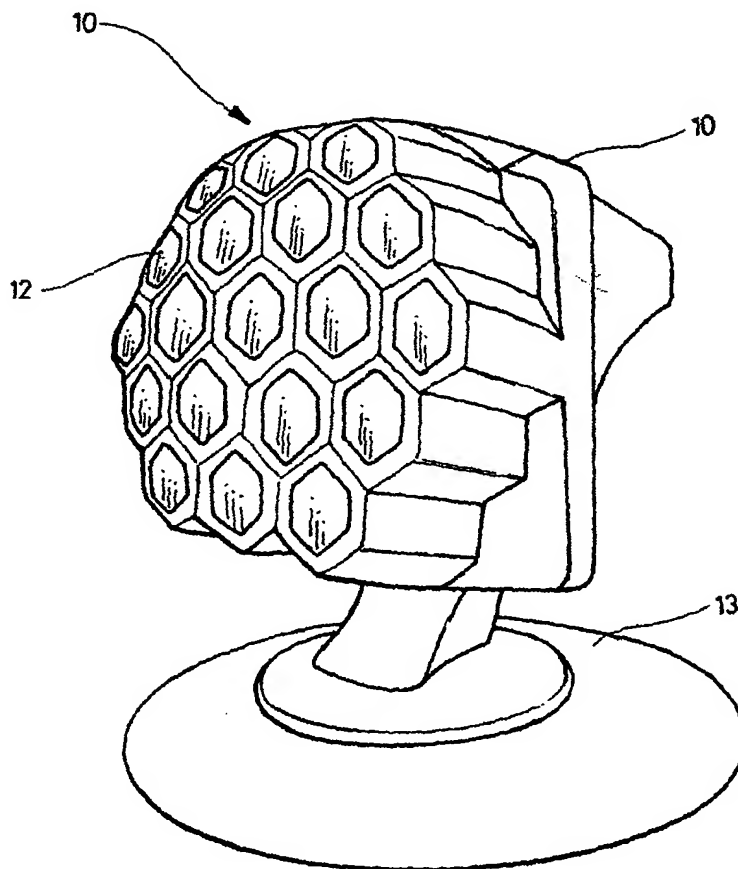
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

[Continued on next page]

(54) Title: TRANSMISSION SYSTEM AND METHOD FOR MULTIPLE PICTURES



(57) Abstract: Disclosed is an electrical transmission system for multiple pictures and its transmission method through internet, that a digital camera assembly is equipped with a number of lenses and CCDs, so that pictures captured from many directions are transmitted to a client computer through internet and the captured pictures are transmitted to a screen of the client computer in a real time according to a required condition selected by a client.



WO 01/73572 A1

**WO 01/73572 A1**



*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## **AN ELECTRICAL TRANSMISSION SYSTEM FOR MULTIPLE PICTURES AND ITS TRANSMISSION METHOD THROUGH INTERNET**

### **BACKGROUND OF THE INVENTION**

5           The present invention relates to an electrical transmission system for multiple pictures and its transmission method through internet. More particularly, the present invention relates to an electrical transmission system for multiple pictures and its transmission method through internet, that a digital camera assembly is equipped with the plurality of lenses and CCDs(Charge Coupled Devices), so that pictures captured  
10 from many directions are transmitted to a client computer through internet and the captured pictures are transmitted to a screen of the client computer in a real time according to a required condition selected by a client.

          In general, picture communication means that a user's computer and the other party's computer, which are geographically separated but connected with each other  
15 through a network, simultaneously transmit image and/or sound data applied from each computer to an application program of the user's computer and to an application program of the other party's computer, so that the computer program of the other party can interchange information with the user's computer program according to the received image and/or sound data to do video conference or video phone call with each  
20 other even in a remote place.

          To do video communication with the separated other party through the network using a video communication system, a digital camera to transfer image and sound information is used. However, because a conventional camera is fixed in one position, it cannot capture the image of the other party properly, thereby the user  
25 cannot easily receive the picture of the other party.



Furthermore, because the conventional video communication system transfers picture captured only at a fixed angle through the digital camera, to transfer pictures captured at other angles, the user(client) must change the angle of the digital camera.

Meanwhile, another example that a lens portion capable of rotating in every  
5 direction is mounted on a monitor of the computer has been made to solve the above problems. However, there is a problem that the camera cannot quickly capture a mobile image following it.

#### **SUMMARY OF THE INVENTION**

10 It is, therefore, an object of the present invention to provide an electrical transmission system for multiple pictures and its transmission method through internet, that a digital camera assembly is equipped with a number of lenses and CCDs(Charge Coupled Devices), so that pictures captured from many directions are transmitted to a client computer through internet and the captured pictures are transmitted onto a  
15 screen of the client computer in a real time according to a required condition selected by a client.

To accomplish the above object, the present invention provides an electrical transmission system for multiple pictures through internet, the transmission system comprising: a digital camera assembly having a number of lenses and a number of  
20 CCDs for transforming image signal of the image entered through each lens into electrical signal; a link server that a number of client computers are connected through internet network; and a computer system compressing image signal of the subject captured by the CCDs according to the required condition selected by the client and transmitting the compressed image data, which is converted into data format for video

communication, to the link server through communication network.

To accomplish the above object, the present invention provides a method for electricalallly transmitting multiple pictures through internet, the method comprising the steps of: determining picture transmission mode meeting the required condition  
5 selected by the client; processing the pictures to be transmitted according to the determined transmission mode; and transmitting the processed picture to the link server.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

10 Further objects and advantages of the invention can be more fully understood from the following detailed description taken in conjunction with the accompanying drawings in which:

Figure 1 is a block diagram of an electrical transmission system for multiple pictures through internet according to the present invention;

15 Figure 2 is a perspective view of an external appearance of a digital camera assembly of the transmission system according to the present invention;

Figure 3 is a flow diagram showing a method for transmitting multiple pictures through internet according to the present invention; and

20 Figures 4a to 4c are views showing a state that full motion images are shown on a monitor of a client computer.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Figure 1 illustrates a block diagram of an electrical transmission system for multiple pictures through internet according to the present invention, and Figure 2

illustrates a perspective view of an external appearance of a digital camera assembly of the transmission system.

As shown in the drawings, the electrical transmission system for multiple picture of the present invention comprises: a digital camera assembly 10 having a number of lenses 12 and a number of CCDs(Charge Coupled Devices) 14 for transforming image signal entered through each lens 12 into electrical signal; a link server 20 connecting a number of client computers 40 through an internet network 30; and a computer system 50 compressing image signal of the subject captured by the CCDs 14 according to a required condition selected by a client and transmitting the compressed image data, which is converted into data format for video communication, to the link server 20 through communication network.

Referring to Figure 2, the digital camera assembly 10 includes a body 11 in the form of beehive, in which a number of lenses 12 and CCDs 14 are installed to capture an image in many directions and a supporter 13 for supporting the body 11.

The computer system 50 includes: a CDS/AGS(Correlated Double Sampling/Automatic Gain Control) 51 for removing noise of the electrical signal received from the CCDs 14 of the digital camera assembly 10 and for automatically amplifying and controlling gain to uniformly output despite the level change of the image signal; an A/D converter 52 for converting analog signal input from the CDS/AGS 51 into digital signal; a compression unit 53 for compressing the captured image signal to get a large number of images; a control unit 54 for controlling the compression unit 53 according to a picture transmission mode selected by the client; a compression and storage memory 55 for individually storing the compressed images output from the compression unit 53; an image processing unit 56 for composing or

separating each of the images; and a data transmission unit 57 for transmitting the images, which are composed or separated by the image processing unit 56, to the link server 20 to transmit the images to the client computer.

Referring to Figures 3 to 4c, the operation of the present invention will be described in detail.

Figure 3 illustrates a flow diagram showing a method for transmitting multiple pictures through internet according to the present invention, and Figures 4a to 4c illustrate views showing a state that full motion pictures are shown on a monitor of the client computer.

As shown in Figure 2, a captured image projected through lenses 12(1,2,3,4,5.....N) is converted into electrical signal in the CCDs 14 (1,2,3,4,5.....N).

Meanwhile, the CDS/AGS 51 removes noise of the electrical signal input from the CCDs 14 and automatically amplifies and controls gain, so that the electrical signal can be always output uniformly despite the level change of the input image signal.

The A/D converter 52 converts analog signal input from the CDS/AGS 51 into digital signal.

The compression processing unit 53 compresses the captured image signal to get a large number of images. The image signal output from the A/D converter 52 is compressed in a form of JPEG(Joint Photographic coding Experts Group).

At this time, the compression rate of the image signal input from the compression processing unit 53 is generally about 10:1.

The compression and storage memory 55 individually stores the compressed images output from the compression unit 53.

Furthermore, the compression and storage memory 55 makes high-speed record and revival possible, and generally uses a flash memory, which is a fixed memory.

The image processing unit 56, which is to individually separate or generally or  
5 partially compose the images stored in the compression and storage memory 55, makes the images to be shown on the screen of the client computer individually, to be shown on the screen of the client computer in a partially composed state, or to be shown on the screen of the client computer in a generally composed state.

The data transmission unit 57 transmits the images, which are composed or  
10 separated by the image processing unit 56, to the link server 20 to transmit the images to the client.

The control unit 54 basically controls the compression processing unit 53, and also controls the general operation of the CCDs 14, the CDS/AGS 51, A/D converter 52, the compression and storage memory 55, the image processing unit 56 and the data  
15 transmission unit 57.

Meanwhile, the composed or separated images, which are transmitted to the link server 30 through a network 21 by the operation of the data transmission unit 57, are transmitted to the client computer connected to the link server 20 through an internet network 30.

20 The transmitted images are shown on at least one or more monitors 41 of client computers in a real time.

Here, the client can choose the images, transmitted through the plural lenses 12 and CCDs 14 of the digital camera assembly, in various types.

That is, the client can choose image selection modes of several types, which

are provided in the link server 20 to see all images of separated state, transmitted from each of the CCDs (1,2,3,4,5,.....N) 14 on the monitor 41.

The control unit 54 of the computer system 50 determines the image selection mode meeting the required condition selected by the client 40.

5       After that, the computer system 50 determines the transmission mode and performs the step of processing the picture to be transmitted.

After performing the above step, the computer system 50 performs the step of transmitting the processed picture to the link server 20.

10       Meanwhile, as the result of determination of the above step, when the required condition selected by the client 40 is determined as that the image processing unit 56 separates the pictures individually(S10), the computer system 50 separates the pictures individually (S20) and transmits them to the link server 20.

15       Thereby, as shown in Figure 4a, all the pictures, i.e., images of the other party, are shown in the separated state on the monitor 41 as many in the number as the CCDs 14 mounted on the digital camera assembly 10, so that the client can see all directions of the photographing place in one spot.

20       As the result of determination of the step(S10), when the required condition selected by the client 40 is determines as that the image processing unit 56 partially composes the pictures, i.e., the image of the other party(S30), the computer system 50 composes the pictures partially and transmits them to the link server 20.

Thereby, as shown in Figure 4b, the pictures, i.e., the pictures of the other party, are shown on the monitor 41 in the partially composed state, so that the client can see all directions of the photographing place in one spot.

As the result of determination of the step(S30), when the required condition

selected by the client 40 is determines as that the image processing unit 56 composes the pictures, i.e., the images of the other party, generally, the control unit 54 composes the pictures generally and transmits them to the link server 20.

Thereby, as shown in Figure 4c, the pictures, i.e., the image of the other party,  
5 are shown on the monitor 41 in the generally composed state, so that the client can see all directions of the photographing place in one spot.

As described set forth, the picture transmission system of the present invention includes the digital camera assembly, which is equipped with the plurality of lenses and CCDs, so that the pictures captured from many directions are transmitted to the  
10 client computer through internet and the captured pictures are transmitted to the screen of the client computer in the real time according to a required condition selected by the client

It will be apparent to those skilled in the art that various modifications and variations can be made in an electrical transmission system for multiple pictures and  
15 its transmission method through internet of the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention covers the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

**WHAT IS CLAIMED IS:**

1. An electrical transmission system for multiple pictures through internet, the transmission system comprising:

5 a digital camera assembly having a number of lenses and a number of CCDs(Charge Coupled Devices) for transforming image signal of captured image entered through each lens into electrical signal;

a link server connecting a number of client computers through an internet network; and

10 a computer system compressing image signal of the image captured by the CCDs according to the required condition selected by a client and transmitting the compressed picture data to the link server through communication network, the picture data being converted into a data format for video communication.

15 2. An electrical transmission system for multiple pictures through internet as claimed in claim 1, wherein the digital camera assembly includes a body in the form of beehive and a supporter for supporting the body, the body being equipped with the lenses and CCDs to capture the image in many directions.

20 3. An electrical transmission system for multiple pictures through internet as claimed in claim 1, wherein the computer system includes:

a CDS/AGS(Correlated Double Sampling/Automatic Gain Control) for removing noise of the electrical signal received from the CCDs and for automatically amplifying and controlling gain to uniformly output despite the level change of the



image signal; an A/D converter for converting analog signal input from the CDS/AGS into digital signal; a compression unit for compressing the captured image signal to get a large number of images; a control unit for controlling the compression unit according to a picture transmission mode selected by the client; a compression and storage  
5 memory for individually storing the compressed images output from the compression unit; an image processing unit for composing or separating each of the images; and a data transmission unit for transmitting the images, which are composed or separated by the image processing unit, to the link server to transmit the images to the client computer.

10

4. An electrical transmission method for multiple pictures through internet, the method comprising the steps of:

determining the picture transmission mode meeting a required condition selected by the client;

15 processing the picture to be transmitted;  
transmitting the processed picture to the link server.

5. An electrical transmission method for multiple pictures through internet as claimed in claim 4, wherein the transmission method includes the step of transmitting  
20 the pictures, individually separated by the image processing unit according to the required condition selected by the client, onto a screen of a client monitor in division.

6. An electrical transmission method for multiple pictures through internet as claimed in claim 4, wherein the transmission method includes the step of transmitting

the pictures, partially composed by the image processing unit according to the required condition selected by the client, onto the screen of the client monitor.

7. An electrical transmission method for multiple pictures through internet as  
5 claimed in claim 4, wherein the transmission method includes the step of transmitting the pictures, generally composed by the image processing unit according to the required condition selected by the client, onto the screen of the client monitor.

Fig. 1

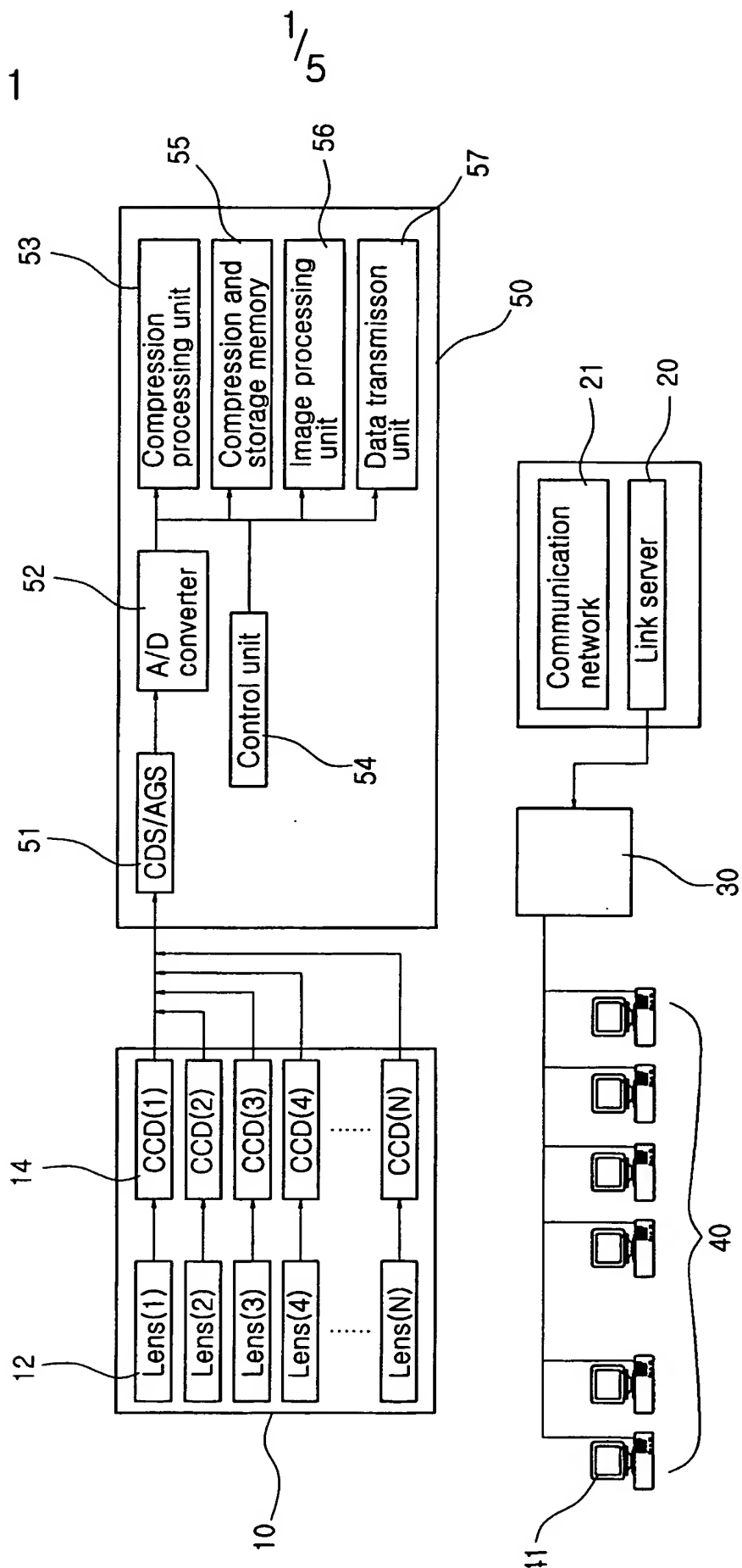


Fig. 2

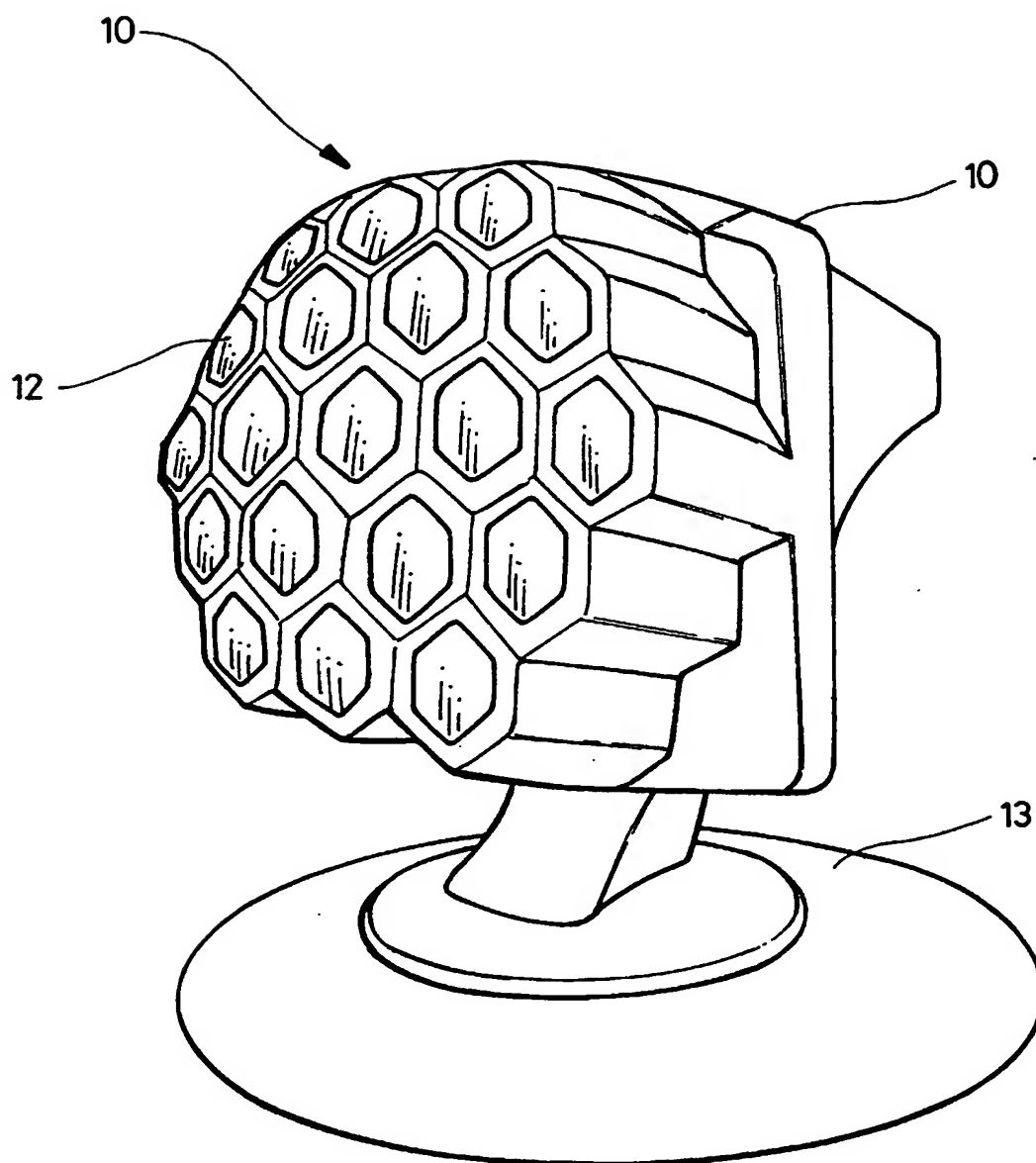


Fig. 3

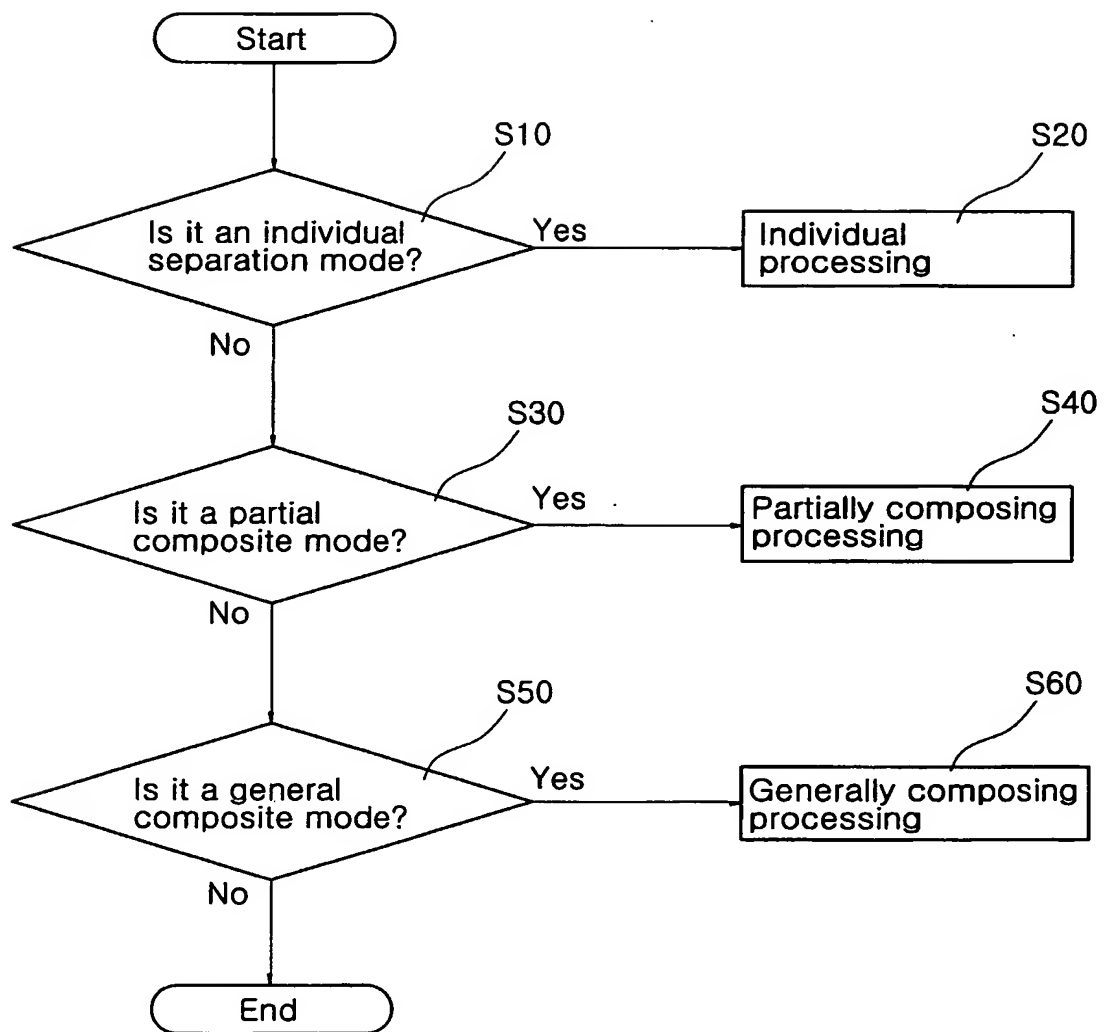


Fig. 4a

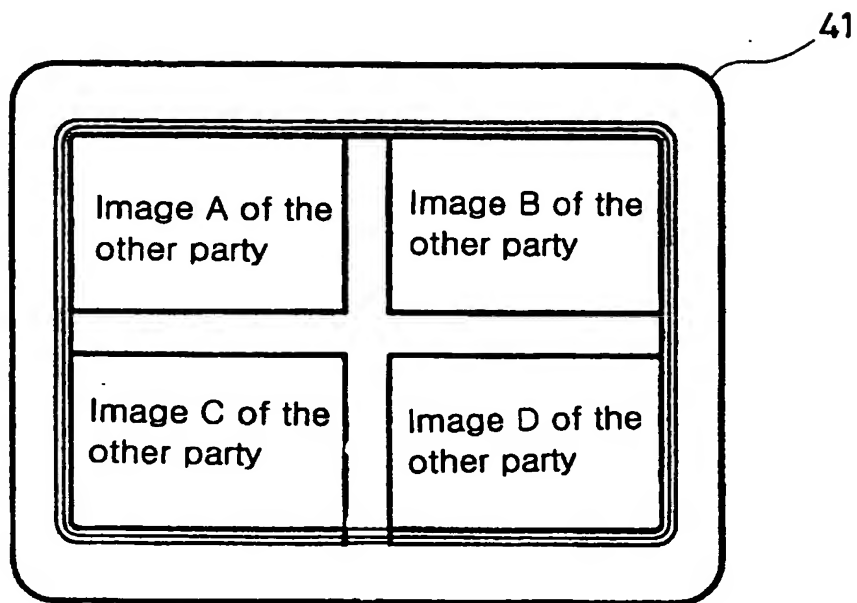


Fig. 4b

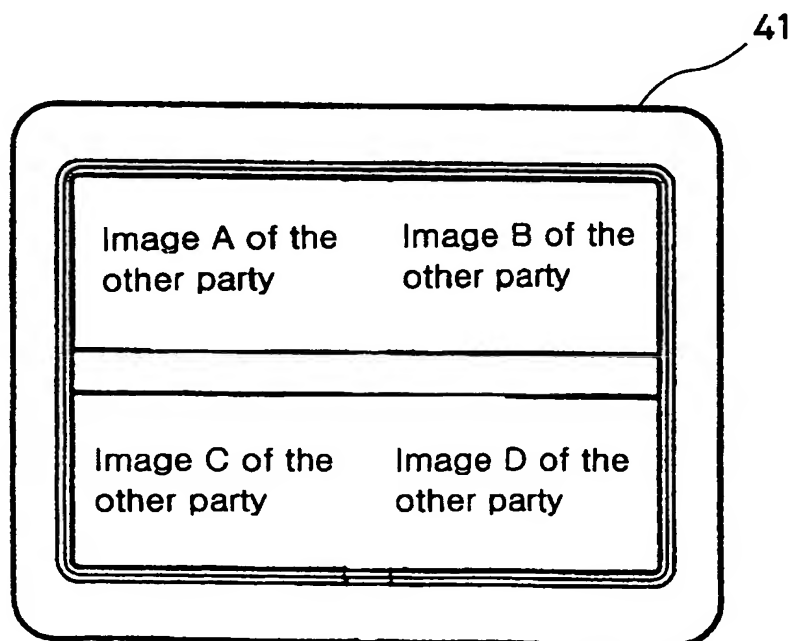
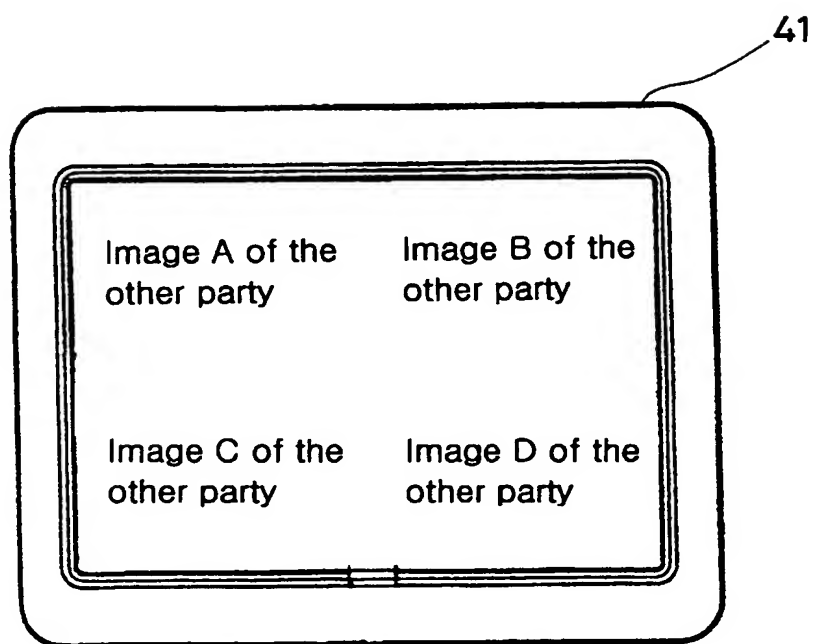


Fig. 4c



## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/KR00/00652**A. CLASSIFICATION OF SUBJECT MATTER****IPC7 G06F 15/16**

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC7 G06F 15/16

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean patents and applications for inventions since 1975

Korean utility models and applications for utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

<http://ep.espacenet.com> (Worldwide search in the European Patent Office), "Charge and Coupled and Device and Beehive"

IEEE/IEE Electronic library (since 1988), "Charge and Coupled and Device and Beehive"

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 93-17070 A (SAMSUNG ELECTRONICS CO., LTD) 29 July 1993 (29.07.93) the whole document	1, 3-7
Y	CHEOL-HEE GARNG ET AL: "APPLICATION CONTENTS TECHNOLOGY" UP-TO-DATE COMPUTER/TELECOMMUNICATIONS/BROADCASTING TECHNOLOGY ILLUSTRATED BY DRAWINGS, Kyobobook publishing Co., Ltd, Seoul Korea, 13 August 1999, pages 415-420	1, 3-7

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

29 JULY 2000 (29.07.2000)

Date of mailing of the international search report

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